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ABSTRACT

The first half of this document reports on research that explores the ways in which knowledge of the world affects judgments of sentence acceptability. Sixty children in grades four through eight were studied at two times, one year apart. The subjects were first interviewed regarding their knowledge of the world in order to identify their role expectations. Subjects were then asked to judge the acceptability of 10 sentences--all of the same syntactic structure--five of which were constructed to reflect subjects' expectations, five to contradict them. (For example, "the girl promises the mother to make the bed" and "the father promises the boy to shoot the squirtgun.") For sentences judged unacceptable, subjects were asked to trace the problem to either semantic, syntactic, or cognitive constraints. Results show that sentences were found unacceptable more frequently when they contradicted subjects' expectations than when they reflected the subjects' prior knowledge of the world. The second half of the paper examines these results in the effort to discover the dimensions of a well-formed sentence, on the basis of which children make judgments of acceptability, and to reveal how the role of prior knowledge changes with children's growth. Three tables and two figures that diagram research results are included. (CC)

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Developmental Trends in Children's Judgments of Disturbing Elements in Sentences

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Abstract

This study was an investigation of the effects of the "message" in grammatically complex sentences on the number of elements older children and young adolescents judged unacceptable; of the importance of syntactic, semantic, and cognitive constraints in affecting these judgments; and of developmental trends, over one year, in judgments of unacceptable elements. Sixty Ss, with 12 each in grades 4 through 8, then 5 through 9, evaluated 10 sentences violating the MDP. Results imply that an adequate grammar must contain rules flexible enough to accommodate subtle semantic and cognitive restrictions on messages of sentences.

Developmental Trends in Children's Judgments of Disturbing Elements in Sentences

A central premise in the theory of generative grammar is that an adequate grammar must account for sentences acceptable to the native speaker (Chomsky, 1961). That is, if the native speaker judges a sentence to be acceptable or admissable in English, then an adequate model or grammar of English must contain a rule for generating that sentence. Chomsky (1965) has noted that acceptability and grammaticality, as characteristics of sentences, are distinct variables, although grammaticality is "one of many factors that interact to determine acceptability" (p. 11). A sentence may be grammatical yet unacceptable because of the demands it places on performance capacities such as memory limitations, and intonational and stylistic factors (Chomsky, 1965, p. 11), or it may be unacceptable due to aspects of sentence structure such as repeated nesting, self-embedding, or the nesting of a long and complex element (Chomsky, 1965, p. 13).

Generally, then, the decision whether a sentence is well-formed rests primarily on its base syntactic structure. Olson (1977) summarized this argument as follows: "[The] meaning of a sentence relies on no private referential or contextual knowledge; nothing is added by the listener. One is justified, therefore, in

concluding that for Chomsky, the meaning is in the sentence per se" (p. 259). Just as the base syntactic structure is the site of meaning, so also is the structure of the base the determinant of well-formedness (Olson, 1977, p. 259).

Thus, the decision regarding acceptability is an assessment of appropriate syntactic forms and lexical choices and is sentence-based, i.e., without consideration of either larger linguistic or extra-linguistic (situational) context. Underlying assumptions are, then, 1) that such judgments can be made in isolation; 2) that native speakers are competent to make such judgments; and 3) that such judgments will, potentially, be universal or uniform. However, two recent experiments, with adult subjects, have demonstrated that training in generative grammar (Spencer, 1973) and experience in teaching sentence diagramming (Hoenigmann and Wildemann, 1976) facilitate judgments of acceptability and grammaticality, respectively. These results argue against the notion that all of us, linguists and non-linguists alike, will agree in discriminating well-formed sentences.

Can one assume, though, that judgments of acceptability will be on such a syntactic basis? Do people use "innate rules" of grammar in their assessments? Might other considerations be involved, for example, semantic considerations (Does this sentence make sense?), or experiential considerations (Could this actually

happen in the [or 'my'] real world?)?

Chomsky (1965) himself has noted that non-syntactic variables are, in fact, involved in determining sentence acceptability. Acceptable utterances are "perfectly natural and immediately comprehensible. . . . , and in no way bizarre or outlandish. . . . . [They] are more likely to be produced, more easily understood, less clumsy, and in some sense more natural" (Chomsky, 1965, pp. 10-11). To an extent, then, Chomsky appears not to disregard entirely the position of the general semanticists, that: "A sentence is well-formed if it is understandable to a listener" (Olson, 1977, p. 259). However, this would seem to be only a secondary concern for Chomsky (1965), with primary consideration being given to syntactic structure.

For others, decisions regarding well-formedness must reflect the wider concerns of language as a means of communication, that is, language in use. As Ortony (1975) emphasized, "the fact that language is for people with memories and other cognitive capacities" (p. 502) requires that attention be given to such important individual performance variables as context and knowledge of the world.

PURPOSE

The manner in which knowledge of the world affects judgments of sentence acceptability was the focus of the research reported

here. Two earlier studies with children and young adolescents in grades four through eight (Note 1) and five through nine (Note 2), had demonstrated that such judgments were in fact affected by their knowledge of the world. Sentences in both of those studies had a complex, but correct, grammatical structure, constituting the only exception to a general pattern in English, termed the Minimum Distanct Principle (Rosenbaum, 1967).[4] An example of such a sentence is, The girl promises the boy to feed the dog. In both studies, the empirically assessed familiarity of the content or message of the sentences was the variable manipulated in order to determine how children's expectations regarding the probability of agent/action "matches" affected their judgments of sentence acceptability.

The present research was an extension of the research just cited and built upon and refined the methodology of those studies. Rather than judgments of overall sentence acceptability, the criterion measure here was the number of unacceptable elements identified in the sentences, as well as the type of element, cognitive, semantic or syntactic, considered to be disturbing. Thus, the purpose was three-fold: to determine the effects of children's knowledge, in the form of relevant belief systems, as well as their linguistic competence, on the number of elements judged unacceptable, to assess the relative importance of cognitive, semantic, and syntactic constraints in affecting children's judgments, and to

examine developmental trends, over one year, in children's judgments of unacceptable elements.

Because the focus was not only on syntactic considerations, the usual question testing well-formedness, namely whether a sentence is an acceptable one in the language, was deemed an insufficient question. To assess whether the children judged the stimulus sentences to be well-formed by referring to syntactic and non-syntactic criteria, a more open-ended question was asked: Does this sentence sound right to you? This question was intended to be more "ecologically valid" in allowing the children to refer to whatever standard or standards seemed most important to them.

METHOD

This research was conducted in two phases, with 12 months intervening. Furthermore, each phase in the data collection involved two steps. First, the children and adolescents were interviewed individually for the purpose of identifying aspects of their belief systems, or knowledge of the world, which would be relevant to the stimulus items used in the second part of the study. Expectations were identified related to roles of mothers, fathers, boys, girls, and teachers. Specifically, Ss were asked who would be the most likely agent to carry out 20 tasks such as housework, e.g., washing windows, making beds; activities associated with the school day, e.g., drawing a picture, going outside to play;

and leisure time activities, e.g., climbing trees, shooting squirt-guns. The second part of each data collection involved asking Ss to evaluate the acceptability of ten sentences, all with the same syntactic structure. Five of the sentences were constructed to reflect Ss' expectations ("harmonious"), and five were constructed to contradict expectations ("contrary"). That is, all ten sentences were, in fact, grammatically correct, and all had the same syntactic structure. However, harmonious sentences contained messages that corresponded with Ss' prior knowledge (e.g., The girl promises the mother to make the bed), whereas contrary sentences contained messages that ran counter to Ss' prior knowledge (e.g., The father promises the boy to shoot the squirtgun). The same ten sentences served as stimulus materials both years.

Population and Sample

The population for this study consisted of male and female children in grades four through eight (during year one) attending two public elementary schools, a junior high school, a parochial school, and, during year two, also a public high school in the same geographic and socio-economic region of a suburban centralized school district. Residents of this community are speakers of standard English. Any child receiving special instruction from a speech therapist or reading consultant was excluded.

A sample of 12 was drawn from each of the five grades; all 60

participants were still available a year later.

For ease of discussion, those Ss in grade four during year one will be identified as group A, those in grade five as group B, those in grade 6 as group C, those in grade seven as group D, and those in grade eight as group E.

Procedures

Identical procedures were followed both years. All experimental materials were individually administered. During the assessment of expectations, Ss were asked to respond according to what they thought was most common, i.e., according to which agent usually carried out each action. Hence, there were no "wrong" answers. In the second part of each data collection, E read each sentence aloud, asked a question measuring literal comprehension of each sentence, then instructed the Ss to evaluate whether the sentences "sounded right." Next, Ss were asked to specify any unacceptable element(s), with E repeating the choices based on syntactic, semantic, and cognitive constraints. That is, the three types of elements that might be considered unacceptable were classified as traceable to: 1) syntactic constraints, i.e., whether the sentence structure was of the preferred form or was correct; 2) semantic constraints on the appropriate use of the word promise, i.e., whether it was correctly used to express an agreement to carry out the actions described in the sentences;[5]

and 3) cognitive constraints on the agent in the sentence, i.e., whether the agent/action match was conceivable or acceptable.

Design and Data Analysis

The fact that comprehension was well established was validated both years. During year one, seven errors occurred in the 600 measures, and during year two, only four errors of comprehension were made. Because there was essentially no variability in the comprehension scores, this factor was not included in any of the statistical analyses. An ANOVA was performed on the number of elements judged unacceptable in the harmonious and contrary sentences by children in the five age groups. These conditions yielded a 5 x 2 x 2 (group by expectation by year) design, with repeated measures over the dimensions of expectation and year. Additionally, Page's L statistic (Page, 1963) was employed to investigate the order of means in the three conditions defined by the semantic, syntactic, and cognitive constraints. This test, based on linear ranks, was designed to identify the relative importance of the three classes of unacceptable elements.

RESULTS

The analysis of variance disclosed that expectation was the only significant main effect: the mean number of unacceptable elements in contrary sentences (4.30) was significantly greater than in harmonious sentences (2.82), $F(1,55) = 77.20$, $p < .0001$.

Two interactions were also significant, both at the .025 level. These were group by expectation, $F(4, 55) = 3.01$, and year by expectation, $F(1, 55) = 5.99$. Both interactions were investigated at the .05 level of significance via *post hoc* comparisons, using Tukey's *A* procedure for the group by expectation interaction and the *lsd* test for the year by expectation interaction (cf. Winer, 1971).

Interpretation of these interactions disclosed generally that the difference between the harmonious and contrary conditions was less pronounced in the oldest two subject groups; and that there

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Insert Figure 1 and

Table 1 about here

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was no significant change in the number of unacceptable elements in contrary sentences from year to year, but that there was a significant increase in the number of unacceptable elements identified in harmonious items during year two. Thus, both interactions

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Insert Figure 2 and

Table 2 about here

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reflected an inverse relationship between *Ss*' age and the

importance of the agent/action match in affecting sentence acceptability.

Page's L statistic was used to test whether an ordered hypothesis about the means of the three classes of unacceptable elements was significantly different from the null hypothesis that the means in those classes would be equal. The order which was significant at the .05 level during year two was: agent (cognitive) > structure (syntactic) > promise (semantic; during year one this order failed to reach significance at the .05 level. However, by including expectation with the sources of unacceptability, yielding six classes, an order of means emerged which was significant at the .001 level overall, and during each separate year. This order was: contrary agent > harmonious structure > contrary structure > harmonious promise > contrary promise > harmonious agent. That is, although agent was the most

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Insert Table 3 about here

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important source of unacceptability in contrary sentences, it was least important in harmonious sentences. Structure was next in importance, being chosen more often in harmonious than in contrary sentences. Finally, promise was also selected as a source of unacceptability more often in harmonious than in contrary

sentences. (It should be noted that the L statistic does not test for significant differences among the means; it merely allows the identification of a significant order of means.)

DISCUSSION

In a process-oriented or constructivist approach to understanding both the language acquisition system and knowledge of grammar, the task of the person developing linguistic facility is to abstract "an implicit model of the language from his [or her] observations" (Reber, 1973, p. 293). The research reported here indicates that older children and young adolescents are developing models of relative well-formedness for sentences violating the MDP. Though the models evolve, it is clear that they do include elements, traceable to cognitive and semantic as well as syntactic constraints, which interact differentially with messages reflecting or contradicting Ss' relevant belief systems.

This research raises many questions about sentence acceptability. What is a well-formed sentence and on what basis or bases do children make this decision? Under what conditions is a promise made, and when is a promise inappropriate? Why do children become more critical of this particular sentence type as they become older? Although it is significant for all age groups, how does the role of relevant prior knowledge change with children's developmental status? The discussion section will be organized around these

questions.

Well-formedness

What are the dimensions of a well-formed sentence? Clearly, we can rule out one point of view: being understandable is not a sufficient condition. In this research, comprehension was not an issue, since it was at a level well above 99 per cent both years. Chomsky's (1965) criterion that the sentence not be bizarre or outlandish, in conjunction with Merleau-Ponty's (1973) statement that, "the perfection of language lies in its capacity to pass unnoticed" (p. 10), may constitute one necessary condition of acceptability: the sentence ought not to call attention to itself. In terms of the present research, well-formed sentences are free from elements that call Ss' attention to themselves.

When the language calls attention to itself, rather than to the message it is intended to convey, it interferes with the communication process. An effect, then, is disequilibrium: the sentence doesn't "sound right." In successful communication, however, a part of our life is elevated into the "logos of discourse" (Ricoeur, 1976, p. 19). The language makes sense because it "fits" our experience and our belief systems, i.e., the language coincides with our knowledge of the world. As Cassirer (1944) explained, Logos, in Greek philosophy, "always suggested and supported the idea of a fundamental identity between the act

of speech and the act of thought (p. 126; italics added). Thus, coincidence of expression and thought -- or the sentence itself and one's relevant belief system -- is a pre-requisite to acceptability. Still, in its simplified form, the coincidence of speech and thought is not a sufficient condition, since, for some of the Ss in the study, even harmonious sentences, coinciding with their prior knowledge, contained unacceptable elements.

So, we shall have to explore further the relationships between knowledge of the world and knowledge of language. As Ortony (1975) implies, it is probably not possible "in any important way to distinguish or isolate the knowledge of the grammar of the language, which is held to be the basis of linguistic competence, from knowledge of the world" (p. 494). One reason why no important distinction can be made may be that "language is not a world of its own. . . . But because we are in the world, . . . we have experience to bring to language" (Ricoeur, 1976, p. 20; italics added).

Specific Constraints

For the purposes of this research, the forms of experience we bring to bear on language were identified as semantic, syntactic, and cognitive. Semantic constraints were operationally defined as traceable to restrictions on the appropriate use of promise in the sentences (cf. Footnote 5). Promises are statements with

illocutionary force if they are uttered seriously, spoken literally, and if the speaker intends to perform the act promised (Stampe, 1975, p. 20).

As a limit to sentence acceptability, this was the least salient source of disturbing elements (cf. Table 3). Subjects often rejected the use of promise as appropriate for reasons based on prior knowledge. For example, promise was disturbing in the sentence, "The child promises the teacher to go outside and play" because, according to the Ss, children would want to go outside, hence they would be more likely to ask to go out than to promise. Also the sentence, "Father promises mother to get dinner ready" was disturbing to many Ss, whose experience was that fathers rarely prepare dinner. Some of these children suggested that agree or offer would be more appropriate lexical choices. One child even suggested "loading" the sentence with words designed to explain the father's uncharacteristic offer to prepare dinner, e.g., "The father promises his wife that he will get dinner for her today because she doesn't feel well." Responses of this sort support McCawley's (1968) view that semantic anomalies reflect violations of the listener's knowledge of the world.

That syntax was identified as a source of unacceptability may seem curious since all of the stimulus sentences were syntactically correct. This result has several important

implications. First, the notion that native speakers may have innate knowledge of linguistic rules, against which to compare sentences when judging whether those sentences are well-formed, must be rejected. Instead, the role of experience-based determinants seems crucial. Second, the results imply not only the lack of an absolute standard of well-formedness based on syntax, but also the lack of an absolute standard for syntax. Many Ss were bothered by structural aspects of the sentences, including even tense, but many were not. And, third, the results make it clear that older children and young adolescents have preferences for certain means of expression. Greenbaum (1976) suggests that individuals may differ in their ability to imagine contexts in which sentences are plausible, as well as their ability to imagine variations of the sentence they are being asked to judge. Hence, fluency and flexibility of thought might even affect decisions of relative well-formedness.

Two of Grice's (1975) conversational principles in the category of manner may help explain why Ss might reject syntactically correct sentences for syntactically-based reasons. Those two principles are: avoid obscurity of expression and avoid ambiguity (Grice, 1975, p. 46). The syntax of the stimuli might be obscure relative to such a close alternative as, The girl promises the boy that she will feed the dog; this is an empirical

question not examined here. However, there is a parallelism in the alternative form -- the girl promises//she acts -- which is not manifest in the sentence structure of the stimuli. One might speculate that the parallel structure makes the meaning of such sentences easier to grasp and reduces both the derivational and the psychological complexity simultaneously.

There are two additional reasons why the stimuli might seem ambiguous. First, in a sentence such as, The girl promises the boy to feed the dog, there are no masculine or feminine pronouns to clarify who is the agent who should feed the dog. Therefore, Ss must rely on their syntactic knowledge of this form in order to identify the agent in the infinitive phrase. In the alternative sentence, The girl promises the boy that she will feed the dog, it is clear, because of the feminine pronoun, that the girl is the agent. A second potential source of ambiguity in sentences of the form employed here was identified by Richek (1976): "the difficulty of MDP-violating structures is likely to be due to the presence of the deceptive, and more proximate, alternate noun" (pp. 805-806). That is, it is logically possible for either the girl or the boy to feed the dog, and as the closer noun phrase, the boy may be a deceptively strong candidate for carrying out the action.

Cognitive constraints based on agent/action matches constituted

the third source of disturbing elements in the stimulus sentences. Reference to Table 3 discloses that such constraints were of great importance when the message of the sentence contradicted Ss assessed prior knowledge, and of minor importance when the message reflected prior knowledge. It should also be recalled that the difference between the harmonious and contrary sentences generally decreased with the increasing age of the Ss (cf. group by expectation interaction, Table 1 and Figure 1). Since this was concomitant with an overall increase in the number of unacceptable elements identified, more notably in the harmonious sentences, it would indicate that factors other than expectation are assuming greater importance in affecting judgments of well-formedness. Reference to the order of means, given in Table 3, shows that syntactic considerations, i.e., preferences for certain means of expression are involved. These preferences deserve greater attention in future research.

Knowledge Revisited

Expectation, i.e., whether the message of the sentences corresponded with Ss' relevant belief systems, significantly affected the number of unacceptable elements identified in the stimulus sentences. There is an impressive body of literature relating knowledge of the world with comprehension and meaning (e.g., Bransford & McCarrell, 1974; Franks, 1974; Brewer, 1974), but we don't yet have a well-developed paradigm for relating

prior knowledge with judgments of acceptability. Perhaps the overriding feature of such a paradigm would have to be its capacity to allow for the relativity of such judgments. Variations in individuals' experiences, both with the world in general and with language in particular, would probably affect their assessments of the well-formedness of a given sentence. More importantly, though, it is almost certain that individuals would use different criteria for judging different types of sentences, depending on context. Frederiksen, Harris, and Duran (1975) have identified three types of contexts usually attending natural discourse: conceptual, relating to beliefs and presuppositions; extralinguistic, relating to the setting; and linguistic, relating to previous discourse.

In the present research, only the conceptual context, i.e., expectations, prior knowledge, beliefs, provided the focus. However, in certain states, e.g., crisis, emergency, or duress, or in settings where persuasion is the goal, e.g., political negotiations, or advertising ("Promise her anything, but give her Arpège"), the extralinguistic context may be a salient determinant of acceptability judgments. The linguistic setting, too, must be included in a satisfactory model. By the standards developed so far, much poetry would be unacceptable -- consider, for example, the e. e. cummings poem (1959) that begins, "anyone lived in a pretty how town / (with up so floating many bells down) / spring

summer autumn winter / he sang his didn't he danced his did." That's clearly not a "well-formed" sentence, is it?

Before summarizing the criteria for well-formed sentences already explored, we might add two more of Grice's (1975) conversational principles, both related to the category of quality: "Do not say what you believe to be false [and] do not say that for which you lack adequate evidence" (p. 46). Both principles bear on the role of relevant belief systems in determining judgments of well-formedness, though we would have to substitute, "Do not accept" for his prohibition, "Do not say."

Chomsky (1965) was correct when he wrote, "Obviously, accectability will be a matter of degree, along various dimensions" (p. 10). However, just as the locus of meaning has shifted, for many psycholinguists, from the sentence per se to the interaction of syntax and knowledge, so also must the locus of acceptability shift away from purely sentence-based considerations. A process-approach to developing a model for acceptability judgments, in which we examine first what people actually do consider when judging relative well-formedness, may eventually be more productive than any a priori attempt to define acceptability. The major lesson to be learned from the psycholinguistic research of the last ten years is that it can be misleading to examine and interpret sentences in isolation and out of context.

SUMMARY

From examination of the results of this research, several initial criteria of well-formedness emerge. They are criteria of exclusion rather than inclusion. Furthermore, they apply to sentences in isolation rather than to connected discourse; and they do not apply to poetic uses of language.

First, the sentence should not be unnecessarily complex, obscure, or ambiguous. Second, the sentence should not call attention to itself in a manner that interrupts communication. The form of the sentence should not conceal or interfere with the communication of its meaning. Third, when we compare the sentence mentally with alternative forms conveying the same meaning, it should be the most appropriate and effective form. Fourth, the chosen means of expression should reflect a coincidence of language and thought. To make the sentence plausible, redundant elements may be required to supply adequate, convincing evidence. Finally, the sentence should "make sense" by virtue of its relationship to our knowledge of the world, our experience, and our relevant belief systems.

Reference Notes

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2. Gowie, C. J. and Powers, J. E. A developmental study of judgments of grammatical acceptability in late childhood and early adolescence. Paper presented at the 1977 meeting of the Boston University Conference on Language Development, Boston, Massachusetts.

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Footnotes

1. Requests for reprints should be addressed to Cheryl J. Gowie, Curry 109, UNC-G, Greensboro, North Carolina 27412.
2. The data collection during year one was supported in part by a grant to the senior author from the Excellence Fund of the University of North Carolina at Greensboro.
3. The authors appreciate both the cooperation of St. Pius X School, Loudonville, New York and of North Colonie Central Schools, Newtonville, New York, and the commitment to educational research expressed by their administrators. Additionally, discussions with Ann Pace contributed substantially to the quality of this manuscript; her insights and criticisms are gratefully acknowledged.
4. The Minimum Distance Principle states that, in a sentence of the form

   (1) NP_1 vb NP_2 to inf vb

   noun $phrase_1$ verb noun $phrase_2$ to infinitive verb

   (The girl tells the boy to feed the dog.)

   the second noun phrase, as the one closer to the infinitive, identifies the agent who carries out the action indicated by the complement verb. Most verbs which can be used in sentences

of this form (e.g., command, expect, order, persuade, require, tell, urge, want) follow the MDP. However, the verb promise is always an exception to the MDP. When promise is inserted in a sentence of form (1), the first noun identifies the subject who will carry out the action indicated by the infinitive.

5. Relevant to the use of promise in this research, Webster's Third International Dictionary of the English Language Unabridged (Springfield, Mass.: G. & C. Merriam, 1966) defines promise, as a noun, as a declaration that one will do or refrain from doing something specified; as a verb, to engage to do or bring about, to give ground for expecting; and notes that implications include: future, binding, solemn, formal, and indicating a definite agreement.

Table 1

Group by Expectation Interaction:

Mean Number of Unacceptable Elements

Identified by Groups A-E

in Harmonious (H) and Contrary (C) Sentences

Condition	Group	Mean[a]
H	A	2.00
H	C	2.38
H	B	2.50
H	D	3.38
H	E	3.83
C	A	4.00
C	D	4.17
C	B	4.33
C	C	4.42
C	E	4.58

[a]Means within the same bracket, defined by a range of 1.25, are not significantly different, $p < .05$, using Tukey's A procedure.

Table 2

Year by Expectation Interaction:

Mean Number of Unacceptable Elements

Identified in Harmonious and Contrary Sentences

During Years One and Two.

Year	Condition	Mean[a]
1	Harmonious	2.50
2	Harmonious	3.13
2	Contrary	4.25
1	Contrary	4.35

[a]Means within the same bracket, defined by a range of 0.43, are not significantly different, $p < .05$, using the least significant difference procedure.

Table 3

Mean Number of Disturbing Elements:

Years 1 and 2 Combined

Element	Mean
Agent (C)[a]	2.68
Structure (H)[b]	1.53
Structure (C)	1.27
Promise (H)	1.07
Promise (C)	0.36
Agent (H)	0.23

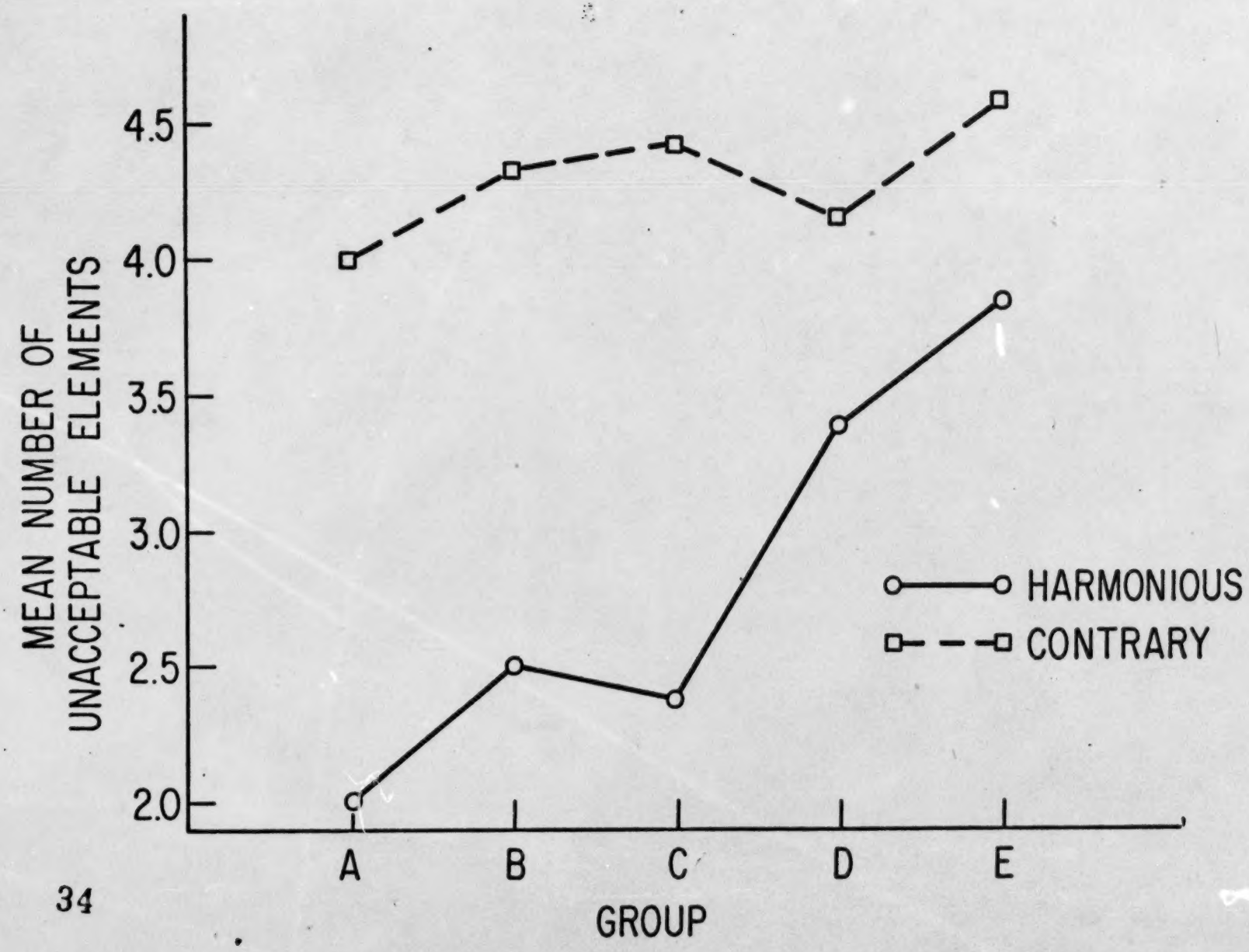
[a] C = Contrary

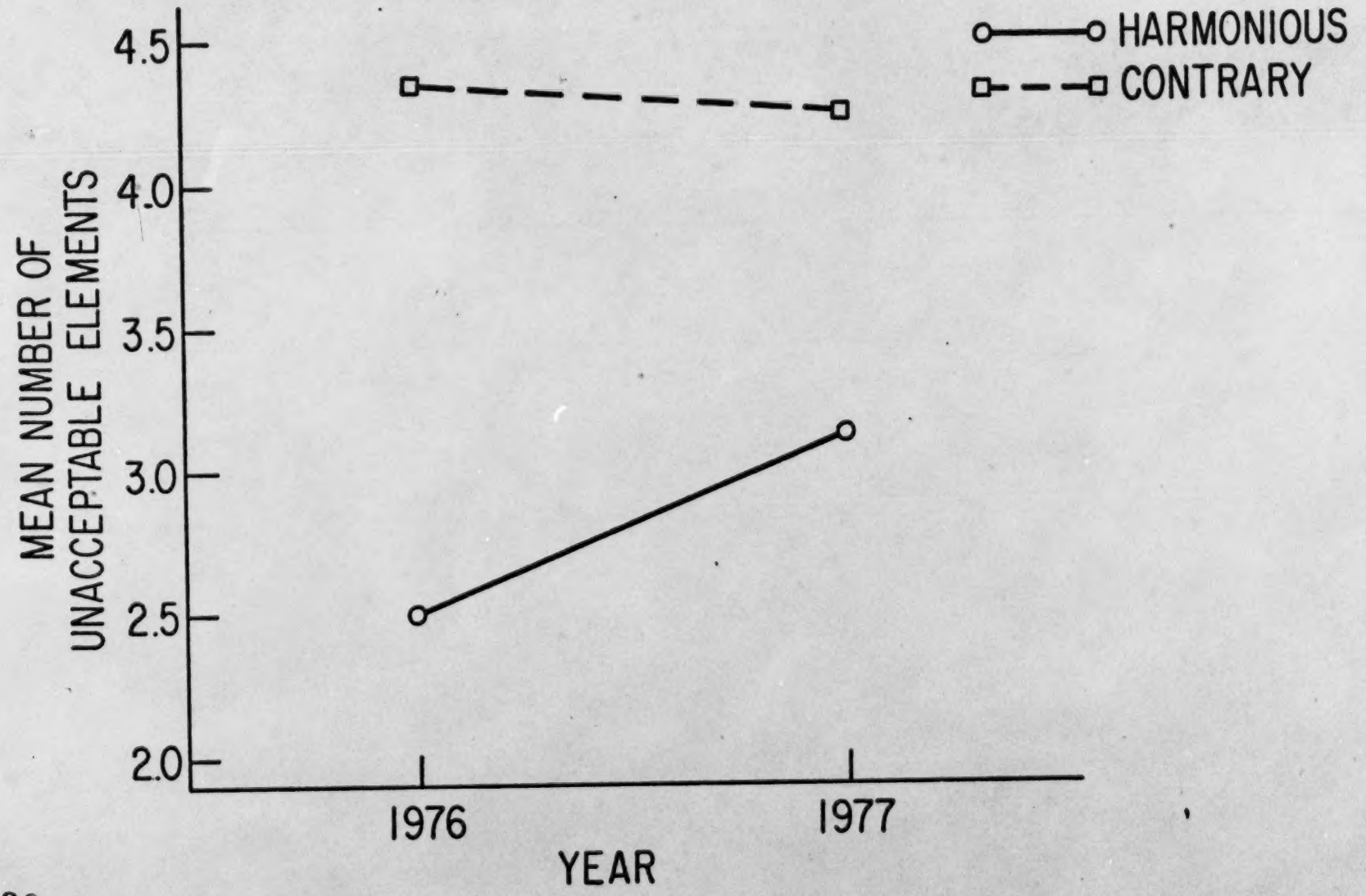
[b] H = Harmonious

Figure Captions

Figure 1. Group by expectation interaction

Figure 2. Year by expectation interaction


MEAN NUMBER OF UNACCEPTABLE ELEMENTS
4.5
4.0
3.5
3.0
2.5
2.0
A
B
C
D
E
GROUP
HARMONIOUS
CONTRARY


HARMONIOUS
CONTRARY
MEAN NUMBER OF UNACCEPTABLE ELEMENTS
4.5
4.0
3.5
3.0
2.5
2.0
1976
1977
YEAR